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Canada
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Joint Canada/U.S.A.
Study of Strategic Petroleum
Reserve Sites in Canada

July, 1978



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JOINT CANADA/U.S.A.
STUDY OF STRATEGIC PETROLEUM
RESERVE SITES IN CANADA

July, 1978

Department of Energy, Mines and Resources, Canada
United States Department of Energy

Joint Canada/U.S.A. Study
of Strategic Petroleum
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I. Summary

Development of a United States Strategic Petroleum Reserve (SPR) facility in Canada offers potential advantage to both countries. A site in Canada could be attractive to the United States, if available for fill in less time and at less cost than similar capacity in the United States and have the additional advantage of helping to meet certain regional storage objectives. At the same time, such a development in Canada possibly could offer economic benefits to Canada in the form of employment and the supply of goods and services. An option to use a small portion of the storage capacity should the need arise could be an additional advantage for Canada.

During the course of the study, officials of both governments compiled and analyzed extensive information on a wide range of issues relating to the Strategic Petroleum Reserve. Officials focused their attention particularly on the economic, technical, legal, environmental and security issues. The interested Canadian provinces contributed to the study.

There are various options by which a Strategic Petroleum Reserve facility in eastern Canada could be developed for use by the United States. The United States' preferred option would be for the Canadian Government to assume the responsibility for development of a storage and throughput complex, working through one of its departments, a crown corporation, or possibly a

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provincial government. This would relieve the United States from responsibility for acquiring any needed property, and for ensuring that unfamiliar legal, environmental and other requirements were met. The Canadian Government recognizes that three companies have submitted proposals for commercial site development, but would be prepared to examine all options for managing development of a storage complex. The role of the Canadian Government, as well as a Canadian option for use of part of the storage capacity, requires negotiation between the two governments if SPR storage in Canada is to be pursued further. Related to this subject are such questions as guarantees, risk bearing, technical certification, and customs and tax regulations, which also require further consideration and/or negotiation. Given its interest in Canadian storage from the standpoint of assuring timely site readiness, the U.S. is especially interested in guarantees, incentives or penalties in the event a site is not ready on schedule. The extent to which Canadian SPR storage would be attractive to the U.S. depends in large measure on the extent to which such provisions reduce the risk of delays in facility development. This is an issue necessitating further definition of both governments' requirements within the context of a particular development option.

Another important area, on which further consultation and negotiation will be necessary, is the supply of goods and services. The attitudes of the U.S. and Canadian Governments regarding supply of goods and services are to ensure that they are made on a competitive basis to the maximum practicable extent.

Since Canada's major interests toward the acceptability of any project are based on economic factors, the Canadian attitude would be largely determined by the industrial and manpower employment benefits which could be derived for Canada through supply of goods and services and construction and operation of the facility. On the other hand, the United States is concerned about participation in the project by U.S. firms and labour.

Other issues pertaining to the development of a strategic petroleum reserve facility in Canada which require further attention include environmental requirements and security matters.

Work has begun on additional technical, economic and administrative matters requiring action before consideration of other items, such as site selection, could begin. Issues requiring negotiation should be addressed promptly.

II. Background

1. SPR Programme

(a) Storage amount

- . Canadian sites could strategically provide useful storage capacity for the SPR depending on such factors as schedule, feasibility, costs, security, etc.
- . Up to about 200 MMB of the billion barrel reserve could be strategically located in Canadian sites and effectively serve U.S. users in the event of an interruption. This will establish the upper limit on the quantity considered for such storage.
- . A Canadian site may be attractive for refined products (residual fuel oil) storage for the East Coast of the United States. As a minimum, the DOE would be interested in considering 10 MMB of product storage in Canada.

Based on these assumptions, a range of 10 to 200 MMB will be considered for possible Canadian storage capacity.

(b) Segregation

The petroleum segregation issue requires that Canadian sites be considered under two separate circumstances, with and without refined product storage (e.g., residual fuel).

The storage of 10 to 20 MMB of No. 4 residual fuel for protection against East Coast losses of refined product imports may be considered for placement in Canadian sites. Selection of a Canadian option for storage of refined product would

require 10 to 20 MMB of segregated storage which is capable of meeting fill and withdrawal requirements outlined below, independent of whether or not it is co-located with crude oil storage.

The maximum segregation requirements for consideration of Canadian storage if a Canadian option is selected are:

With Product		Without Product	
<u>Crude</u>	<u>% Type 1</u>	<u>Crude</u>	<u>% Type 1</u>
(MMB)	(Sour Crude)	(MMB)	(Sour Crude)
200-210	76	220	76

(c) Fill/Withdrawal Capabilities

The fill requirements for Canadian storage options must be integrated into overall SPR Program plans to achieve schedule milestones. At this time, a final decision has not been made on whether the 1,000 MMB reserve will be completed earlier than the end of 1985. Consideration will be given to sites that can be filled by the end of 1983 and by the end of 1985, pending a final decision on the target date for completing the Reserve.

(i) Crude Facilities

Withdrawal facilities for crude oil should be designed to be capable of exploiting the deep water port attributes of Canadian sites. Based on likely demand centers to be served from any potential Canadian site(s), withdrawal rates averaging approximately 2 MMB/D must be achievable.

Facilities to handle deliveries at this rate should be developed to process 50 per cent (by volume) in tankers of less than 60,000 DWT and 50 per cent (by volume) in VLCCs.

(ii) Refined Product Facilities

Withdrawal facilities for refined product must be designed to be capable of completely evacuating stored volumes within 45 days from start-up. Consequently, for up to 20 MMB of product storage, average 45-day withdrawal rates must be equal or exceed 0.4 MMB/D (independent of whether or not co-located with crude storage) and be capable of movement by tankers of less than 60,000 DWT.

2. Storage in Canada

(a) Reasons for Consideration of a Canadian Site:

The objective of the United States Strategic Petroleum Reserve program is to develop, to the extent possible by 1983 and no later than 1985, facilities capable of holding up to one billion barrels of crude oil and petroleum products. The need for expeditious development of storage facilities at locations suitable for distributing oil to U.S. destinations, and for minimizing the cost of such development, warrants examination of potential SPR storage in Canada with the aim of determining whether Canadian sites can be readied for storage and filled on a basis affording advantages of timeliness and cost to the U.S.

(b) Canadian Need for Storage:

An assessment of Canadian need for emergency reserves was made based on two fundamental approaches:

- (i) Minimum Canadian commitment to the Agreement on an International Energy Program.
- (ii) Canadian requirement, independent of international agreements, in order to avoid excessive economic and social disruption in the event of a pre-defined oil supply disruption scenario.

In both cases there was no immediate need for emergency reserves. With regard to possible future need the conclusions are dependent on such assumptions as projections of domestic oil supply/demand and total imported oil needs, severity of supply disruption scenario chosen, amount of oil assumed "drawable" from storage in the existing oil supply system, effectiveness of internal emergency demand restraint programs and regional and individual product supply considerations. With approach (i) using the most pessimistic (high) import scenario and assuming present inventory levels remain the same no additional reserves would be required until the early 1990's to meet IEA commitments. With approach (ii) the wide range of possible assumptions in the areas mentioned above results in considerable variability of conclusions. Even in the most pessimistic (high imports, high disruption) case chosen, however, the earliest that additional reserves are likely to be required is about 1984.

Preliminary findings from a study of Canada's regional and individual product versus crude oil storage needs indicate that there may be justification for individual product storage for all or a portion of any future Canadian SPR.

(c) Canadian and U.S. Economic Interests:

Potential economic benefits are the major factor behind Canadian interest in development of an SPR facility in Canada. Such benefits would be derived through employment, industrial participation in the supply of goods and services, and regional development. While recognizing the need for bidding on generally competitive terms, Canada's approach would be to maximize, as far as practicable, the economic and industrial benefits to be derived from the project. The U.S. Government would desire economic and industrial benefits to be derived from the project and, where contracts are put out for international bid, U.S. firms would have an opportunity to participate.

(d) Transshipping:

While the Canadian Government has no direct interest in the use for transshipment of a petroleum storage facility developed primarily for SPR purposes, the provincial governments and the companies that have submitted proposals have indicated an interest in pursuing this possibility. Certain advantages could accrue from using a facility for both "dead" Strategic Reserve storage and "live" transshipment. A transshipping operation

would absorb a share of common investment and operating costs; this could result in a lower cost for the Strategic Reserve operation. Greater economic benefit to the region would also accrue as transshipment would generate additional annual income through greater permanent employment at site, and provide continuing stimulus to the local marine service sector due to the sustained tanker pattern of transshipment. Such a facility may also reduce the landed costs of a portion of future imported oil needs.

The U.S. Government has indicated that it has no need for a "live" transshipment facility in conjunction with the SPR and that such a facility, if compatible with the SPR's needs, would be the sole responsibility of commercial interests who may desire to develop and operate it.

III. SPR Facility in Canada - Issues

1. Canadian Government Participation in Site Development

There are a number of potential options which could be utilized for the United States to obtain the use of a Canadian storage site for the SPR programme including: lease or purchase of a developed site, lease or purchase of an undeveloped site followed by United States construction contracting, and a storage contract with a developer-operator.

The SPR is a tightly scheduled construction and site development project. In that context, were the United States to assume responsibility for developing a facility in Canada, the difficulties of acquiring the needed real property, complying with Canadian environmental laws and requirements, and meeting unfamiliar zoning, labour laws and other requirements, while not an insuperable obstacle for less urgent programs, could hinder timely completion of SPR storage facilities. In addition, considering the tight time frame for development of sites to meet a 1983-1985 one billion barrel reserve objective, a major U.S. concern is that U.S. managerial effort and time requirements for any site development in Canada be minimized in order to facilitate Gulf Coast site development. The United States Government therefore believes that the best way to assure expeditious development of a storage complex in Canada would be for the Canadian Government to take responsibility for developing the site on a basis consistent with

the SPR's timetable. The U.S. Government believes that no private developer could provide an assurance, in which the U.S. Government would have equal confidence, that the SPR's schedule would be met. This conclusion rests upon the premise, supported by the SPR's Congressional mandate and Presidential direction that time is of the essence in creating facilities in which to store oil to protect the United States against the effects of a severe energy supply interruption..

Of the possible options for site development, the United States would prefer to lease or purchase a developed oil storage and throughput complex from the Canadian federal government with site selection and design to be mutually agreed upon. If a lease were utilized, DOE would seek "no-year" appropriations for a 15-20 year lease. Under this option, the Canadian Government would be responsible for implementation, which could be effected by acquisition of a developed site from a private company or a province, through a lease agreement with a private company or a province, or by acquisition of the site and letting a construction contract. Whichever of these procedures were followed, the Canadian Government, either through one of its departments or a crown corporation, would be responsible for ensuring that the necessary property was acquired, that environmental and zoning regulations were met, and that all other requirements were fulfilled in order to provide a completed storage and throughput

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complex in accordance with the agreed schedule and price. Were a province to be involved, some of these responsibilities would be undertaken by the province, but the United States Government would seek assurances from the Government of Canada that these responsibilities would be met.

The Canadian Government recognizes that three private companies are preparing plans for the development of sites which they have proposed, but would be prepared to examine all possible options for managing development of the storage complex.

Specific arrangements for site operation would be subject to negotiation. The United States Government would want to assume full responsibility once the site were developed, by contracting with a site operator. Prior to finalizing any agreement to establish an SPR facility in Canada, it would be necessary to ensure that all procedures regarding site operation were agreed to by the Canadian and United States Governments, as well as the government of the province in which any site were located.

2. Canadian Option to use Part of the Storage Facility

At the present time Canada has no need for the storage of petroleum reserves. The possibility of a future need, however, makes it desirable that, if the United States should decide on the use of a Canadian site, any arrangement with regard to such facilities include an option for Canadian use of a portion,

possibly up to 10 million barrels, of the total capacity. In view of a potential requirement by both countries for individual product storage, it would also be desirable that the capability of each site for individual product and crude grade storage segregation be considered in the site selection process.

The United States would be prepared to consider entering into an arrangement whereby Canada would have an option for storage services at a Canadian site. It would be necessary to establish the arrangements under which Canada could exercise the option, and the manner in which the United States, if it were site operator, would be responsible through its contracts for throughputting, storing and drawing down Canadian-owned oil.

It is recognized that the terms and conditions of an arrangement whereby Canada would have an option on use of part of a storage capacity require further consideration and negotiation.

3. Supply of Goods and Services

To meet the Canadian and United States Government interests, the procurement objectives would be to ensure that the procurement is consistent with proper economy and the expeditious carrying out of the project.

Since Canada's major interest towards the acceptability of the project relate to economic benefits the Canadian Government desires that the supply of goods and services should be undertaken in accordance with the procurement policy and provisions of the Canadian federal and/or provincial governments.

There remains a need to reconcile the Canadian Government's principal interest in economic benefits with those of the United States, which emphasizes equality of competitive opportunity by U.S. firms and labour.

The resolution of these issues may vary depending upon the manner in which any storage site development is structured contractually, and on the strength of assurances that Canadian SPR storage will be accomplished on a generally competitive time and cost basis.

4. Site Selection

Three companies have submitted information relevant to the development of sites in Canada for the SPR program. Wabanex Ltd. has proposed use of an abandoned iron ore mine on Bell Island, Newfoundland, while the Home Oil Group and Domtar Inc. have each proposed different salt-cavern sites near the Strait of Canso in Nova Scotia. In order for other sites to be considered for selection, submission of the following information has been requested by September 1978:

- (a) A comprehensive conceptual design;
- (b) Current cost estimate for site development;
- (c) A detailed geotechnical study to determine quality and extent of salt masses for leaching.

Any proposals submitted after the September deadline could be evaluated on their merits to the extent feasible, but there would be a high risk that the sites could not be developed in time to meet the one billion barrel reserve goal in 1983-1985, and this would be a major factor in deciding whether to continue consideration of such a site(s).

Any Canadian site would have to be cost-competitive with Gulf Coast salt domes and offer other advantages which could not be met by alternative domestic sites. The SPR office of the U.S. Department of Energy has stated that cost competitiveness of candidate sites together with throughput facilities, will be evaluated on the basis of life cycle costs per barrel for a 15-year period, including real estate purchase or lease costs, site development and construction costs (including wells, pumps, pipelines and other equipment), operation and maintenance costs and one complete cycle of fill and withdrawal costs (excluding transportation costs for withdrawal). Annual costs, such as operating costs or lease payments, will be discounted at the rate of 10 per cent per year cost of money. Costs will be measured in constant FY 78 U.S. dollars.

The standard for comparison for each candidate site will be equivalent amounts of storage in substitute Gulf Coast salt dome facilities that currently are under serious consideration by the SPR office.

Current total 15-year life cycle cost estimates, based in part on actual costs, are approximately \$2.00 per barrel for facilities fill and operation, but excluding transportation differentials. Salvage value of facilities will not be considered as part of the analysis. These estimates will be updated at the time of making any decision regarding Canadian storage sites and the United States will provide access to methods used to determine the comparative cost.

5. Technical Certification

The United States Government has stipulated that it must either be able to certify that any site would hold oil prior to final selection or receive assurances that it would be reimbursed for all costs related to testing, design and development up to the point that a site was found to be unsuitable for crude oil and petroleum product storage. Certification must be accomplished in accordance with procedures and principles applied to U.S. storage.

6. Environmental Requirements

Issues of environmental protection with respect to development of storage sites in Canada are of concern to both governments and

neither government would want to proceed with site development unless adequate environmental analysis had been performed. It is uncertain as to whether under current U.S. law a complete Environmental Impact Statement (EIS) would be required for a storage site located in a foreign country. Even if it is determined that a complete U.S. EIS need not be issued for a Canadian site, application of the Canadian Environmental Assessment and Review Process (EARP) would appear likely to result in approximately the same time elapsing before final environmental approvals are obtained.

It should be noted that, while there has been substantial environmental analysis performed, a considerable amount of work remains to be done before assessment of environmental impacts can be completed.

7. Security of and Access to Facility

It is anticipated that the two governments should be able to establish acceptable requirements with respect to security and access.

(a) Security:

Security issues encompass two separate types of concerns.

First, consideration must be given to the security protection required in a normal industrial situation. In this regard, such issues as adequacy of perimeter fencing at the storage site, systems for identification of personnel who have access

to the site, etc. would be considered. The definition and elaboration of such issues should be relatively straightforward.

The second concern is with possible military threats to the storage site. Such issues could most properly be evaluated by the appropriate defence authorities of the two governments. There would appear to be no need to defer further storage decisions pending a study of the military security issues.

(b) Access:

The United States requires assurances from both the Canadian federal government and provincial governments that any storage site in Canada and oil stored there would be readily accessible to the U.S. at all times. As part of any SPR agreement it should be possible to provide firm assurances of access to any storage site, and ensure that there would be no government controls or regulations hindering U.S. government access to and withdrawal of its SPR oil.

8. Relevant Canadian Tax and Customs Regulations

It is expected that issues relating to Canadian income and customs taxation, and other related questions of Canadian

regulation, would be the subject of negotiations between the two countries and that a mutually acceptable agreement on such issues could be arranged.

Canadian customs officials have, in the past, permitted the duty free entry of all goods, which are and remain the property of the U.S. Government. A consistent application of this interpretation would enable the U.S. Government to import U.S.-owned crude oil, petroleum products, and construction supplies, free of customs duties and sales or consumption tax. The U.S. Government would have to retain ownership of these imported goods in Canada, for this exemption to apply. It is anticipated that mutually acceptable arrangements on tax and customs issues can be negotiated whereby U.S. SPR oil would enter Canada without payment of duties or taxes and could be exported immediately upon notification of the Canadian Government.

9. Form of Agreement

Regardless of the extent of involvement of the Canadian Government in the development and/or operation of an SPR site in Canada, an international agreement of some form would probably be required. It is envisaged that the agreement would cover all aspects of development and operation of a petroleum storage facility relating to the responsibilities and undertakings of the two governments. The U.S. Government would require that such an

agreement provide assurances with respect to timely completion of the project and other matters. In Canada's case, it is recognized that appropriate arrangements would be required between the federal government and the province(s) concerned.

The U.S. Government has not determined at this time, whether, to meet its needs, any international agreement should take the form of a Treaty or Executive Agreement.

IV. Further Action Required

Further required work has been classified under the categories of administrative/executive, technical/economic, and items requiring negotiation:

Administrative/executive

1. Advise relevant companies of need for early submission of substantive technical and economic information.
2. Arrange with the appropriate defense authorities for a study of the military security situation.
3. Definition of information required in order to proceed with environmental approvals for each site.
4. Determination of form of agreement.

Technical/economic

5. Determination of technical suitability of site for storage.
6. Analysis of cost of Canadian storage compared with U.S. storage.
7. Analysis of timeliness of Canadian site preparation.
8. Determination of specific requirements for technical certification of each site.

Negotiation

9. Determination of the most preferable option for site development and operation.
10. Determination of provisions regarding the supply of goods and services.

11. Determination of guarantees, incentives, or penalties with respect to development of site on schedule and within cost limits.
12. Determination of tax and customs regulations applicable to implementation of a project.
13. Determination of the arrangements providing for a Canadian option to use part of any facility developed.
14. Determination of arrangements under which transshipment could be incorporated in the operation of a facility.

Action on items in the administrative/executive category have been initiated or will be taken at the appropriate time. Work has begun on those items in the technical/economic category requiring action before consideration of other items, such as site selection, could begin. Items requiring negotiation should be addressed promptly.

With regard to the identification of additional tasks and related matters which must be completed prior to tentative selection of a Canadian site(s), a further meeting between officials of the two governments is needed to resolve the following:

1. Identification of specific additional tasks and proposed schedule of completion.
2. Determination of which party will be responsible for completing each task.
3. Determination of which party will bear the costs for completing each task.

APPENDICES

Canadian Material

1. Canadian Need for Storage
2. Environmental Regulations
3. Canadian Constitutional Issues and Applicable Canadian Legislation
4. Canadian Federal Labour Legislation
5. Newfoundland Labour Legislation
6. Nova Scotia Labour Legislation
7. Canadian Taxation, Customs, Forms of Assessment

U.S. Material

1. U.S. Legal Requirements for Ownership of an SPR Storage Site in Canada
2. U.S. Procedures for Awarding Construction and Management Contracts
3. U.S. Requirements for Access and Protection

Copies of these Appendices are available on request from:

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